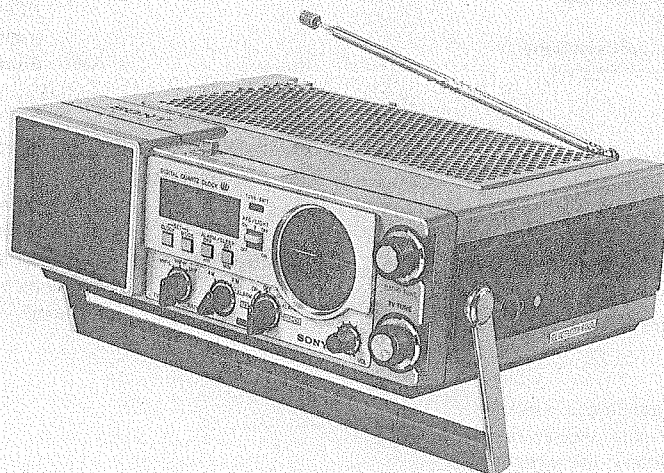


# TV-413

## AC-121W


US Model  
Canadian Model




## TV-FM/AM RECEIVER

### SPECIFICATIONS

#### SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

#### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ !!

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE  SUR LES DIAGRAMMES SCHEMATIQUES, LES VUES EXPLODÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT SONT IDENTIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

Television System:	American and Canadian TV standards
Picture Tube:	9.4 cm, 4" (screen measured diagonally), 50° deflection
Semiconductors:	43 transistors, 38 diodes and 2 ICs
Antennas:	VHF, UHF: Built-in telescopic antenna (300 $\Omega$ balanced) 75 $\Omega$ unbalanced external antenna jack
Channel Coverage:	VHF channels: 2 – 13 UHF channels: 14 – 83
Intermediate Frequencies:	Picture i-f carrier: 45.75 MHz Sound i-f carrier: 41.25 MHz
Sound System:	4.5 MHz intercarrier Output Power: 1.5 W (at 10 % harmonic distortion)
Speaker:	10 cm (4 inches) dia, 4 $\Omega$
Output:	Earphone (minijack) . . . . . 1 for 8 $\Omega$ earphone or load impedance 10 k $\Omega$ or higher

— Continued on page 2 —

# SONY

## SERVICE MANUAL

3288

**Automatic Controls:** AFC (automatic frequency control)  
AGC (automatic gain control)

**Anode Voltage:** 6.7 kV at 20  $\mu$ A beam current

**Power Requirements:** 120 V ac, 60 Hz, with AC-121W ac power adaptor  
9 V dc, six batteries size D (IEC Designation LR20)  
12 V car battery with optional Sony car battery cord DCC-16W or DCC-16AW

**Power Consumption:** 13 W ac  
8 W dc (in 12 V operation)

**Dimensions:** Approx. 273 (w) x 92 (h) x 215 (d) mm  
10  $\frac{3}{4}$  (w) x 3  $\frac{5}{8}$  (h) x 8  $\frac{1}{2}$  (d) inches  
including projecting parts and controls, excluding handle or hood

**Net Weight:** Approx. 2.2 kg (4 lb 14 oz)  
without batteries

## Battery Life

Battery life is dependent on operating conditions and the type of batteries used. The following table shows some examples; the upper row shows the battery life with an intermittent use of two-hours on and two-hours off, and the lower shows that with continuous use.

## TV viewing

Eveready No. 1050	Eveready heavy duty No. 1250	Eveready alkaline No. E95
11 hours	16 hours	33 hours
8 hours	16 hours	24 hours

## RADIO SECTION

**Frequency Range:** FM: 87.5 — 108 MHz  
AM: 530 — 1,605 kHz

**Antennas:** FM: Built-in telescopic antenna (300  $\Omega$  balanced)  
75  $\Omega$  unbalanced external antenna jack  
AM: Built-in ferrite-rod antenna

## TIMER SECTION

**Time Display System:** 12-hour display with AM/PM indicators

**Power Requirements:** 1.5 V dc  
Battery size "AA" x 1 (IEC Designation R6)

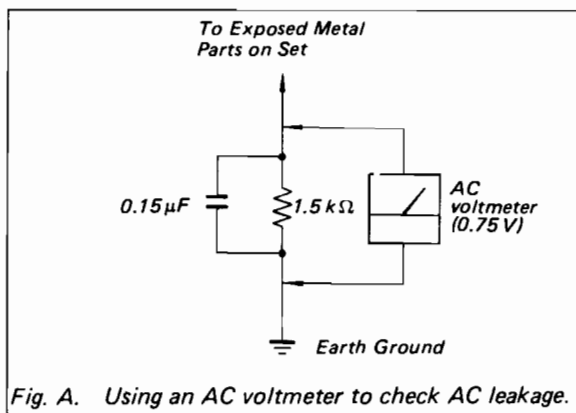
**Accessories Supplied:** AC power adaptor AC-121W  
Earphone ME-20H  
TV hood



## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).  
Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.



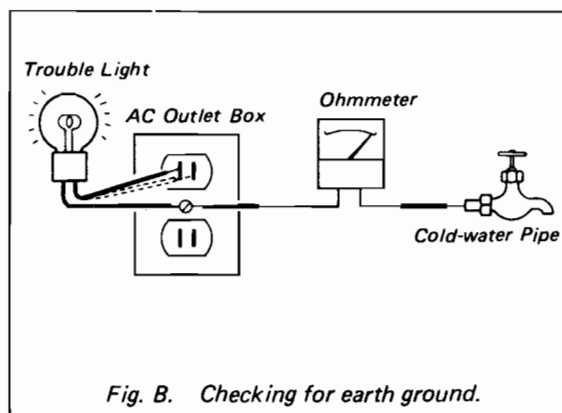
## LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

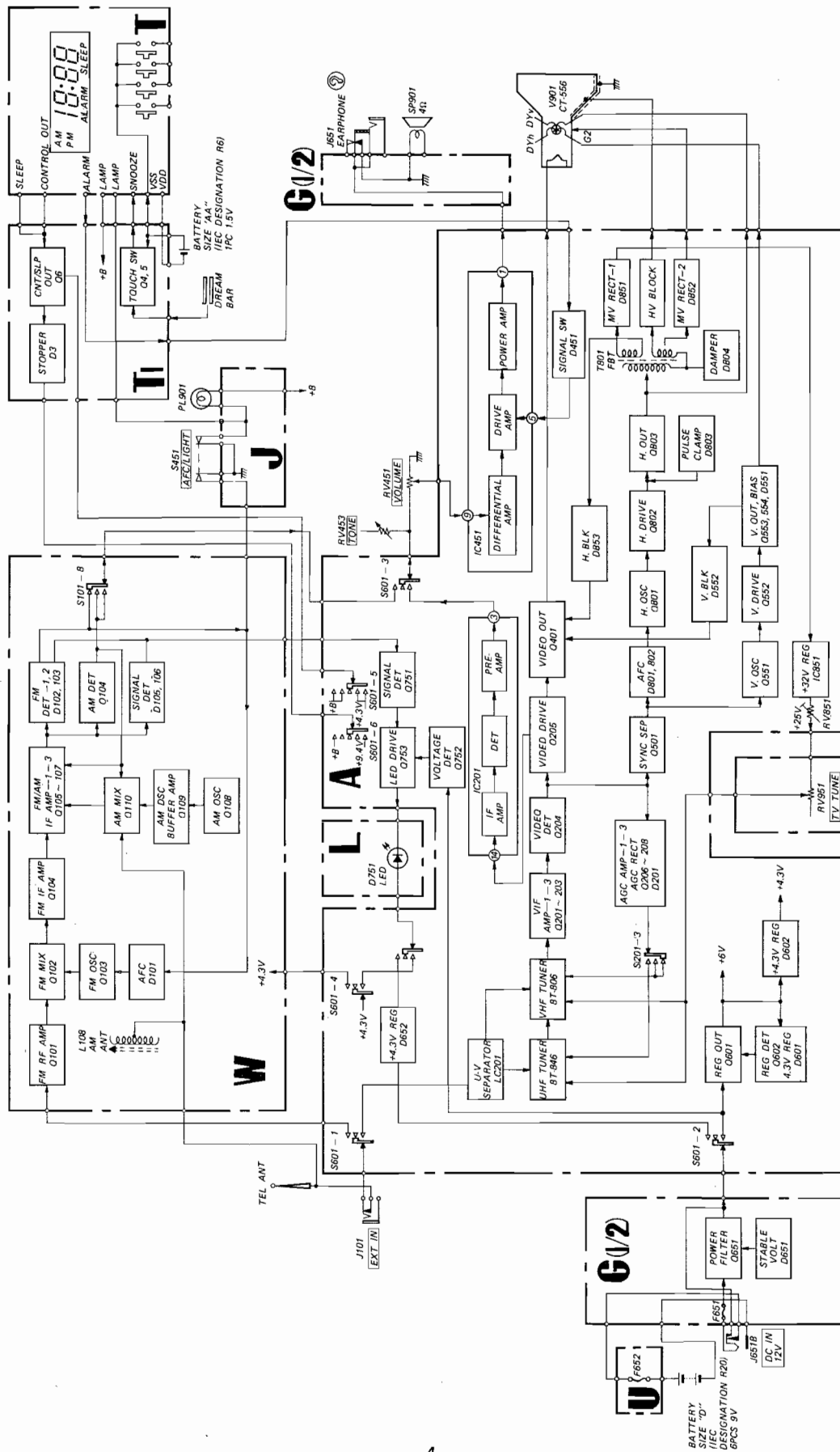
## HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60–100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

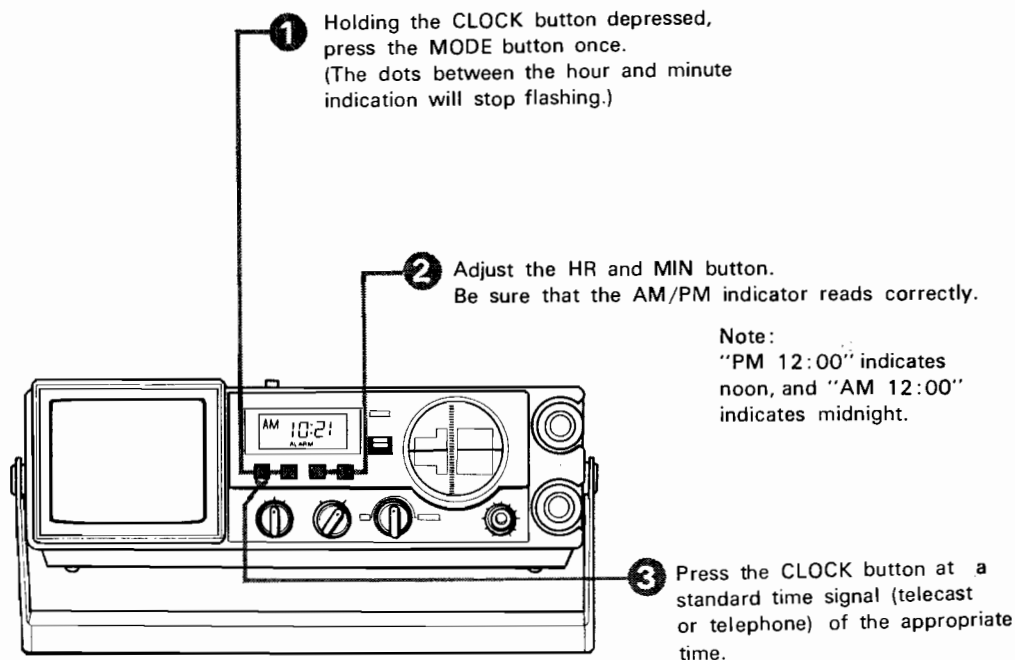


## SECTION 1 OUTLINE

### 1-1. BLOCK DIAGRAM



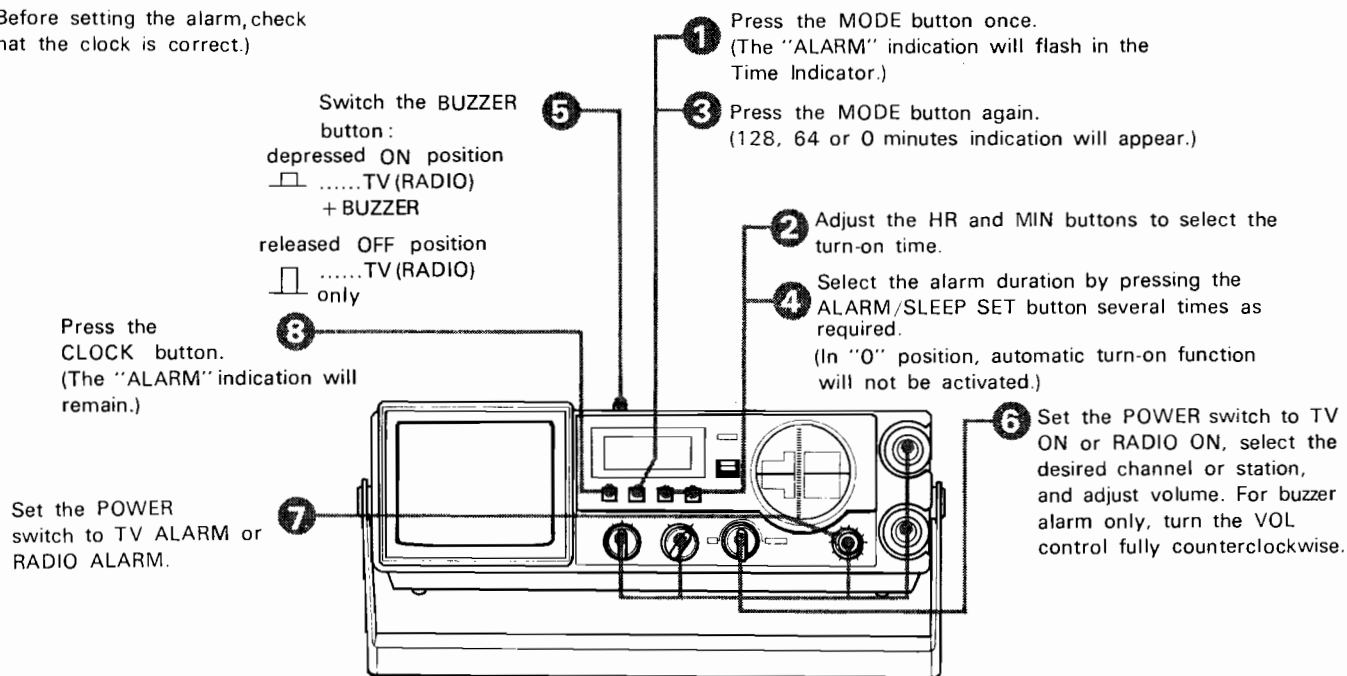
## 1-2. CLOCK ADJUSTMENT



(The dots between the hour and minute indication begin to flash and the time indicator window will then show the regular clock time.)

## 1-3. ALARM SET AND ALARM DURATION

(Before setting the alarm, check that the clock is correct.)



- For repeat alarm, touch the DREAM BAR.
- To reset the alarm setting, press the CLOCK button and repeat through steps 1 2 3 4 above.
- To cancel the alarm function before the turn-on time, select

the 0 position in step 4 above.

- To turn off manually during the alarm duration, press the ALARM/SLEEP OFF button.

- At the preset time, the TV and/or buzzer or radio and/or buzzer will come on automatically, and it will shut itself off automatically after about 128 or 64 minutes, selected in step ④ above.
- If you leave the POWER switch in TV ALARM or RADIO ALARM position, there is no need to reset the alarm every day because of this set's 24-hour system.
- Make sure that there is no earphone connected to the Ⓜ jack. Otherwise, the alarm sound cannot be heard from the speaker.

## Snooze Alarm for Slow Risers (using the DREAM BAR)

If you awake to the TV and/or buzzer or radio and/or buzzer in the morning but want to doze for a few more minutes, just lightly touch the DREAM BAR; TV and/or buzzer or radio and/or buzzer will be silenced, but will automatically sound off again after about 7 minutes. If you then want to doze more, touch the bar again. You will be awakened again and again until you decide to get up. This sequence will continue during the preselected alarm duration of 128 or 64 minutes.

- If the DREAM BAR is not touched for more than 4 minutes after the alarm sound has come on, the alarm function will be canceled.

## 1-4. SLEEP SET

(Before operation, check that the clock is correct.)

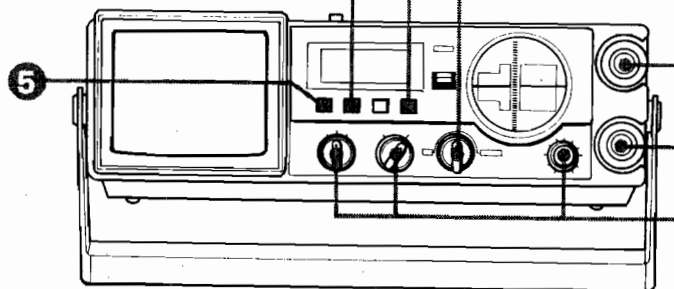
Press the MODE button three times.  
(The "SLEEP" indication will flash in the Time Indicator.)

Press the ALARM/SLEEP SET button once or twice and select the desired sleep duration; 64 or 32 minutes.

Set the POWER Switch to TV ALARM or RADIO ALARM.

After the adjustment press to display the regular clock time.

Tune in the desired channel or station and adjust volume.



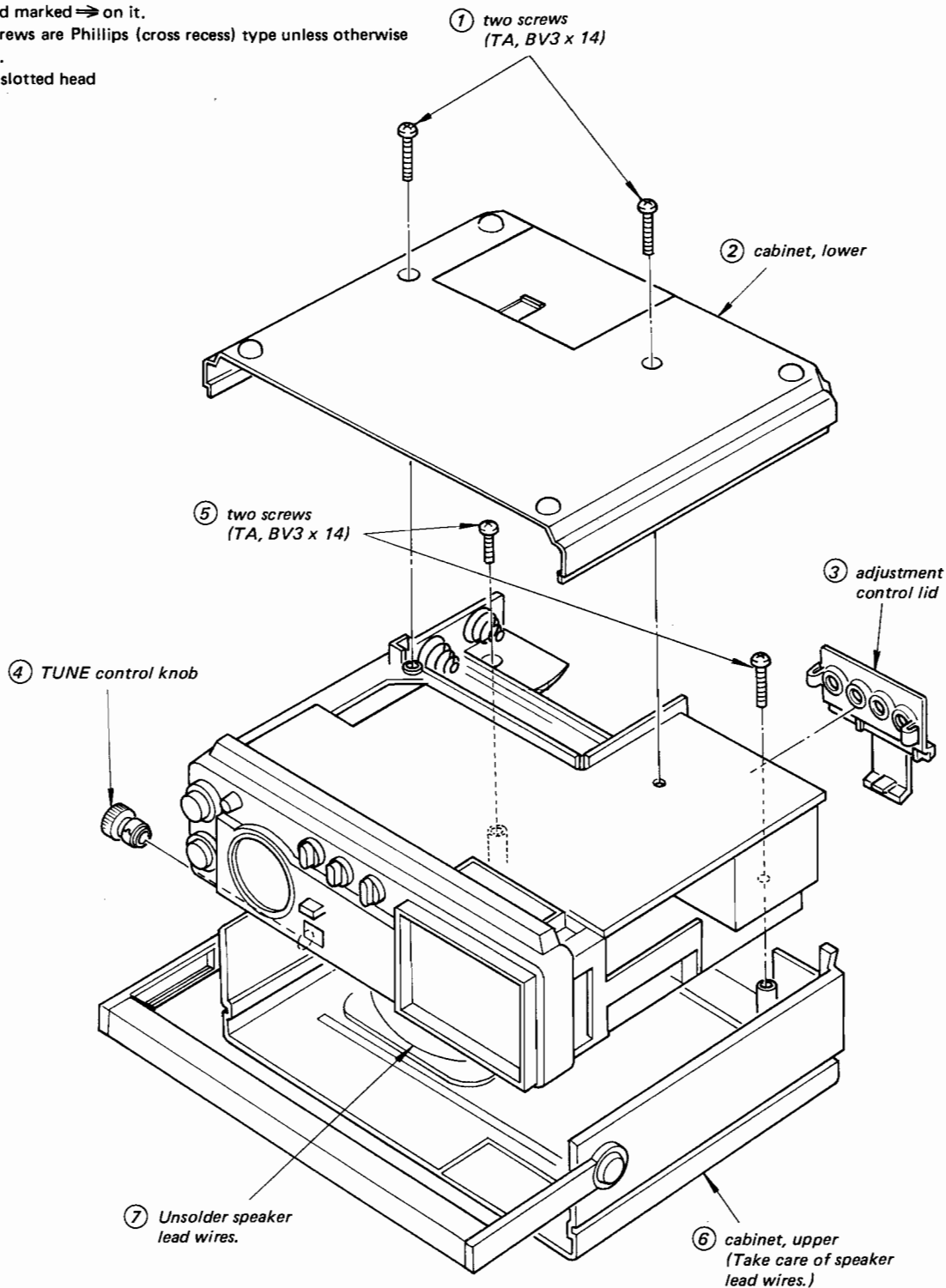
- To reset the sleep setting, press the CLOCK button and repeat through steps ②③ above.
- To turn off manually during the sleep duration, press the ALARM/SLEEP OFF button.

## SECTION 2 DISASSEMBLY

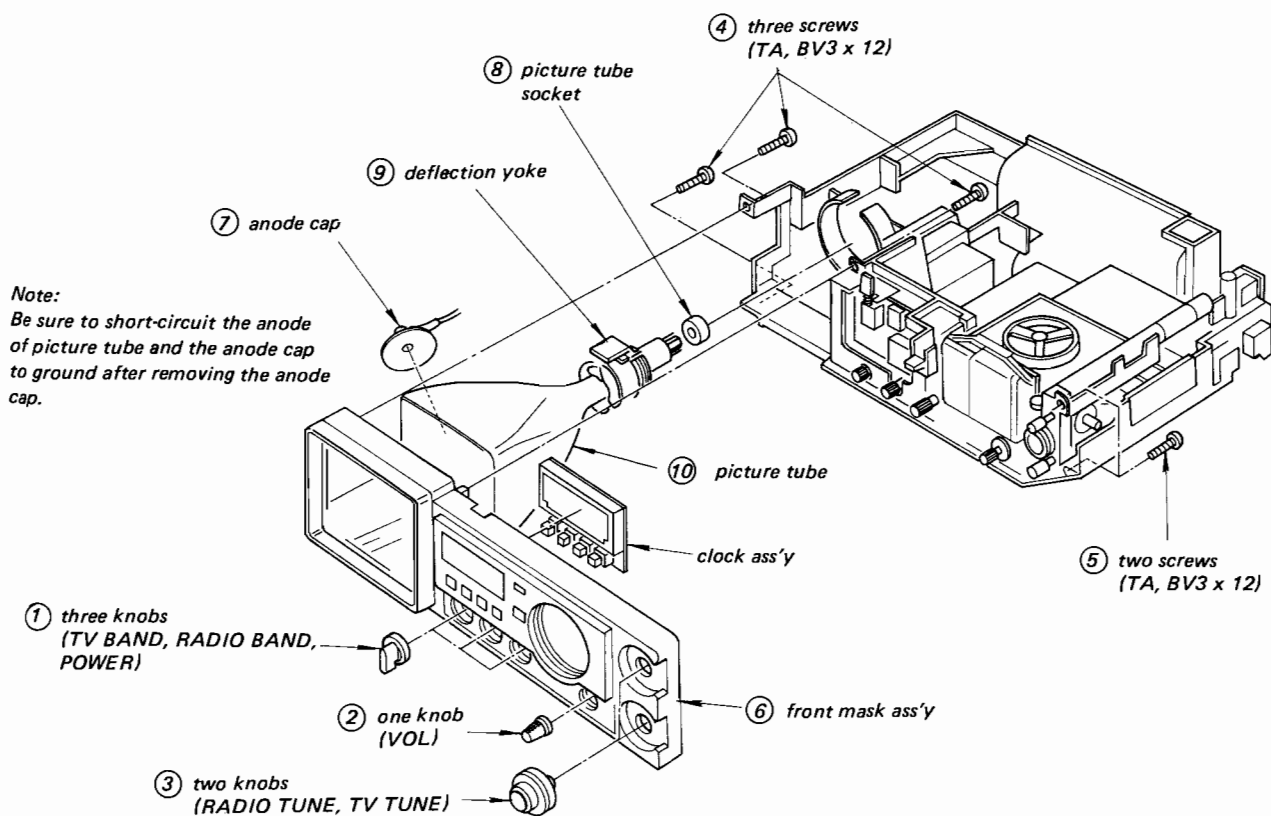
### 2-1. CABINET REMOVAL

**Note:**

- Follow the disassembly procedure in the numerical order given.
- When removing the rear cover, take out all the screws around marked  $\Rightarrow$  on it.
- All screws are Phillips (cross recess) type unless otherwise noted.  
(—) = slotted head

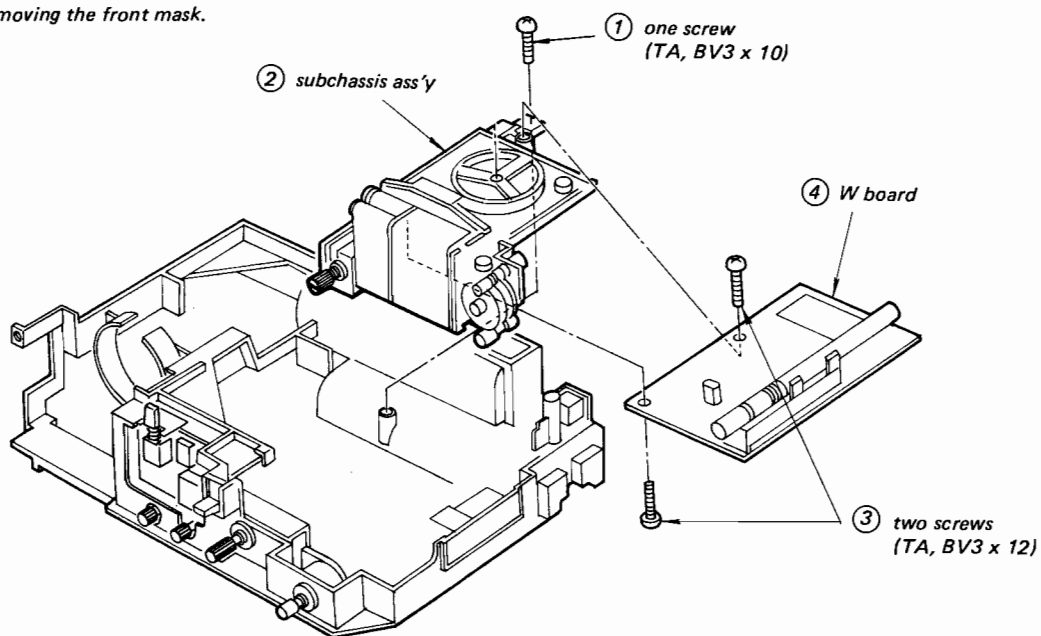


## 2-2. PICTURE TUBE REMOVAL

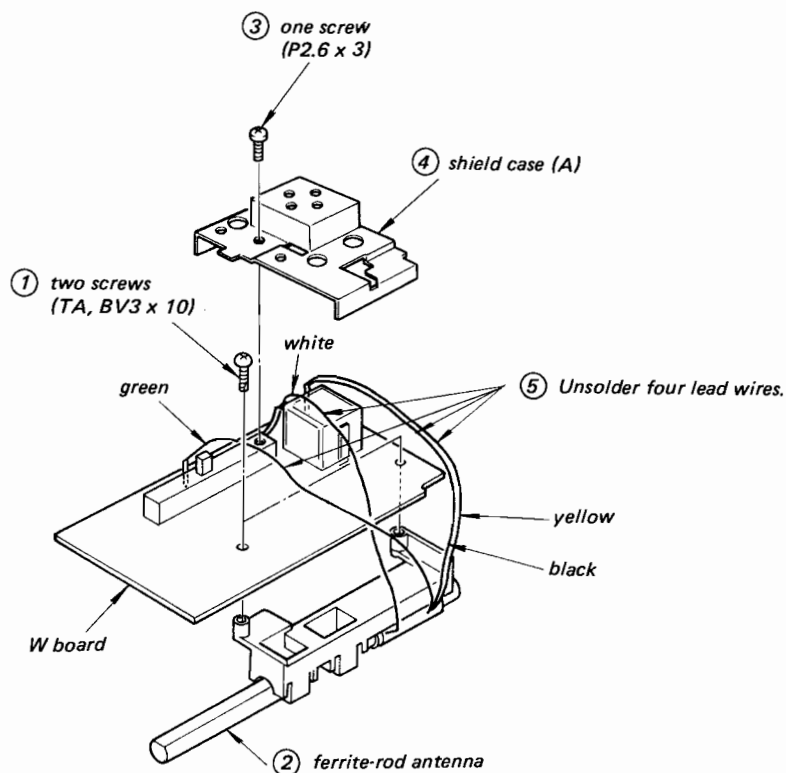


## 2-3. W BOARD REMOVAL

**Note:** Perform this removal after removing the front mask.

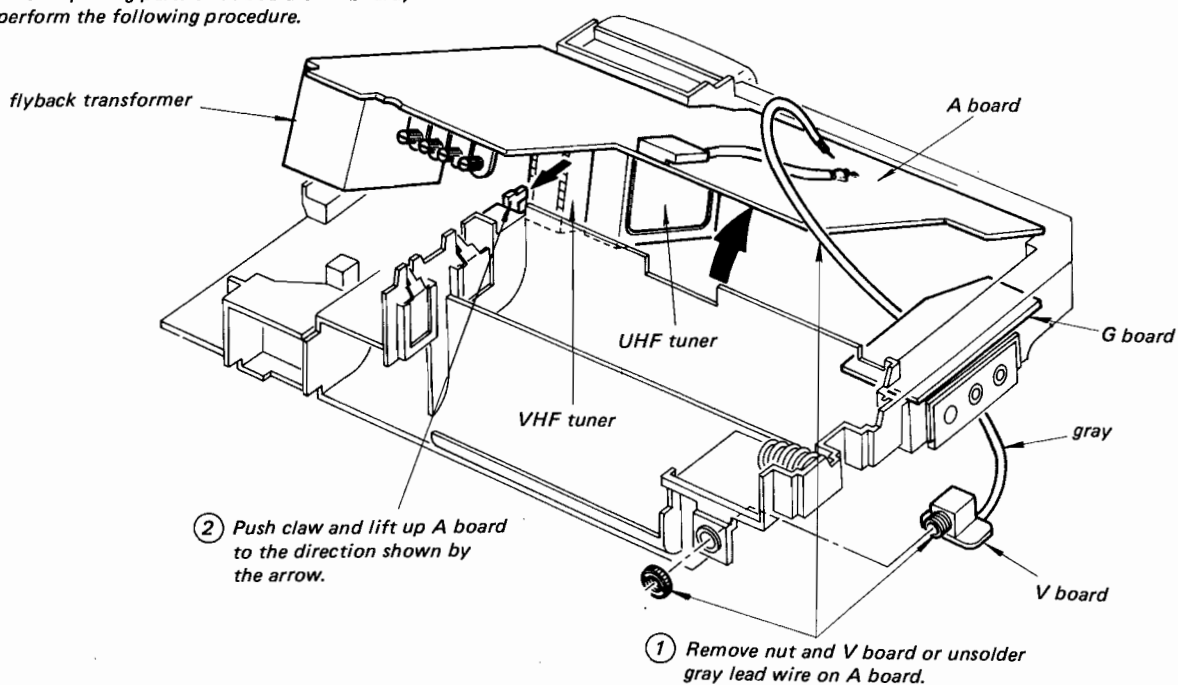


## 2-4. FERRITE-ROD ANTENNA REMOVAL



## 2-5. PARTS REPLACEMENT ON A AND G BOARDS

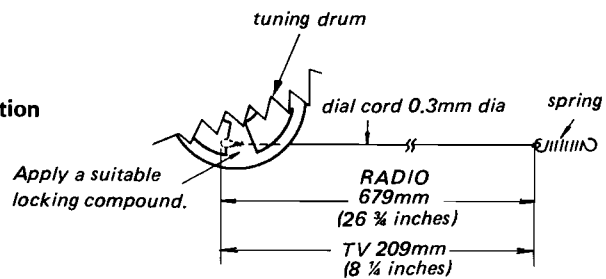
When replacing parts on A board or G board, perform the following procedure.



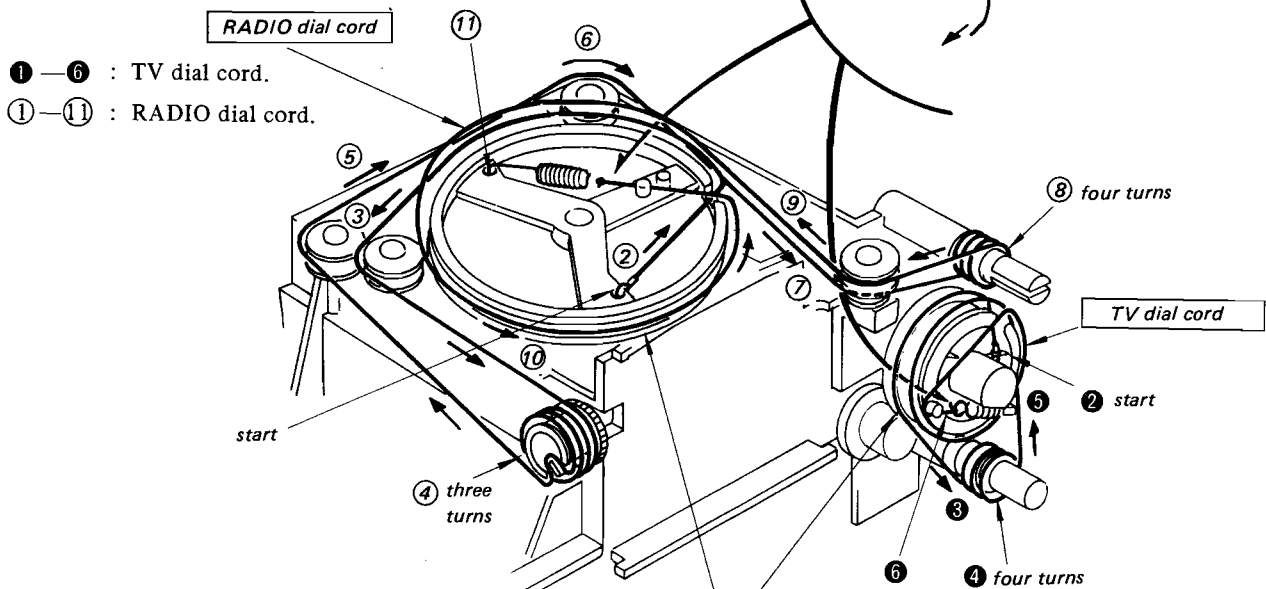


## 2-6. DIAL CORD STRINGING

### (1) Preparation



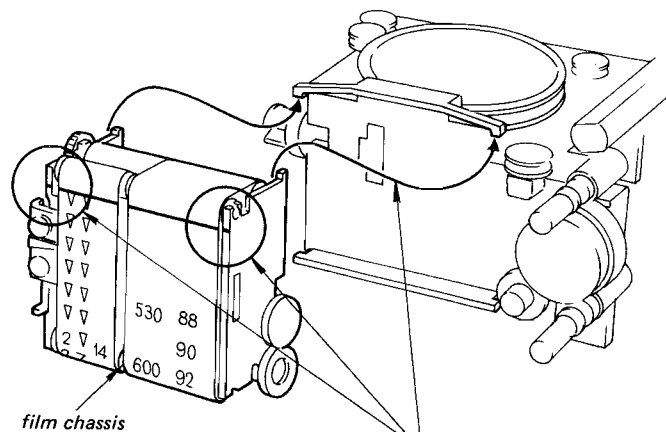
### (2) Stringing



Note: Apply a suitable locking compound to tie and hooking portion.

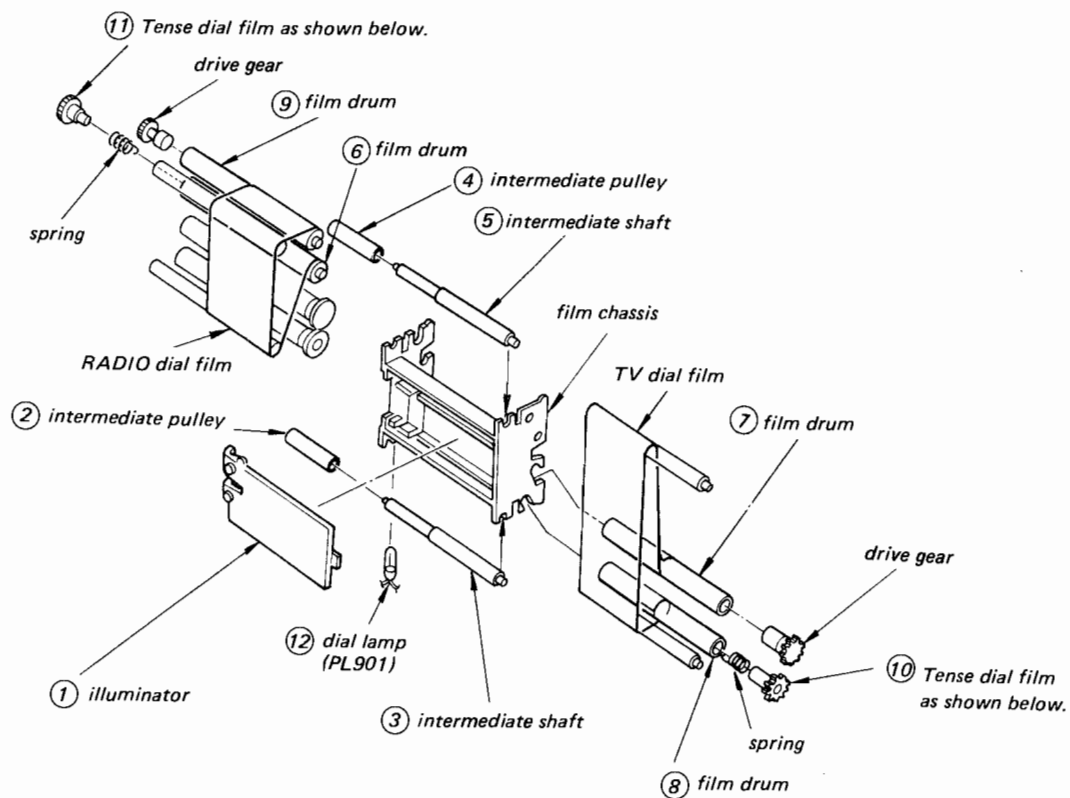
① Turn the tuning drum fully counterclockwise.

### (3) Calibration

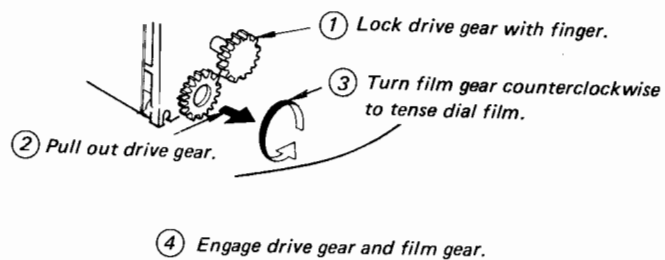


Set TV and RADIO films as shown in figure and install film chassis.

## 2-7. FILM CHASSIS ASSEMBLY



## Dial Film Tensing

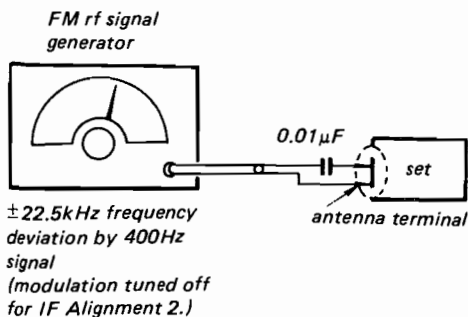


## SECTION 3 ADJUSTMENTS

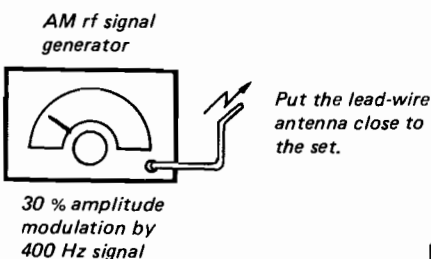
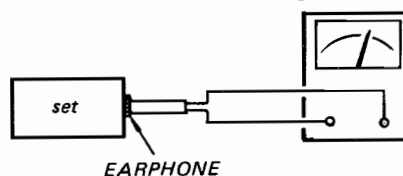
### 3-1. W BOARD ADJUSTMENTS

Setting: POWER Switch: RADIO  
RADIO BAND Switch: FM or AM

- Note:**
- These adjustment should be performed with rated power supply voltage.
  - Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



VOM ①  
(range: 0.5–5V ac)



FM IF ALIGNMENT 2  
(10.7MHz with no modulation)  
Adjust for 0V reading on VOM ②.  
T103

VOM ②  
(range: 1V dc)

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
1,680kHz	CT105
520kHz	T107

AM IF ALIGNMENT (455kHz)	
Adjust for a maximum reading on VOM ①.	
T104	
T108	

FM IF ALIGNMENT 1 (10.7MHz with modulation)	
Adjust for a maximum reading on VOM ①.	
T103	
T102	
T101	

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
620kHz	L108
1,400kHz	CT103

L101	CT101
87.5MHz	108MHz
Adjust for a maximum reading on VOM ①.	
FM TRACKING ADJUSTMENT	

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
L103	87.5MHz
CT102	108 MHz

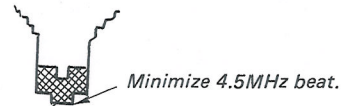


### 3-2. A BOARD ADJUSTMENTS

- Note:**
- Setting: POWER Switch-TV
  - Test Equipment Required
    - VOM
    - Regulated DC Power Supply
    - Oscilloscope
  - Preparations
    - Tune in an off-air signal.
    - Set V. HOLD and H. HOLD controls for correct sync.
    - Set CONTR and BRIGHT controls for best picture.
  - These adjustment should be performed with rated power supply voltage.

#### 4.5MHz TRAP


- Complete preparations.
- Turn tuning knob clockwise for 4.5MHz beat on the oscilloscope.
- Adjust L204 for minimum 4.5MHz beat.



#### SIF

Adjust L206 for maximum-clear sound.

#### DET OUTPUT LEVEL ADJ

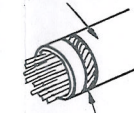
- Complete preparations.
- When the output voltage is lower than 0.55Vp-p, solder the portion marked .

#### V. SIZE

- Complete preparations.
- Adjust RV552 for best vertical size.

#### SCRN

neck of picture tube

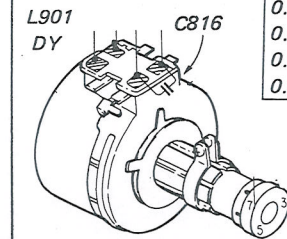


Identification Mark	Soldering Portion
Black	A and B
Red	Open
No mark	A

#### H. SIZE

- Complete preparations.
- Select the capacitance of C816 for best picture size.

Capacitance	Picture Size
0.0022μF/100V	narrow
0.0033μF/100V	
0.0047μF/100V	
0.0068μF/100V	
0.0082μF/100V	wide

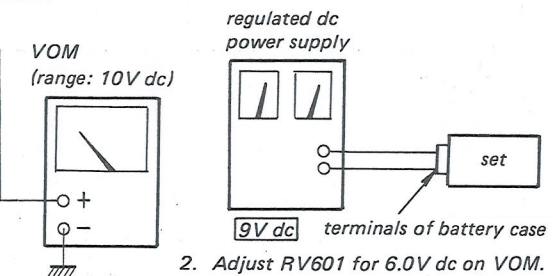


#### H. FREQ

- Complete preparations.
- Connect 3.3μF/16V electrolytic capacitor during this adjustment as shown.
- Adjust L801 to synchronize the picture.

#### +6V ADJ

- Supply 9V dc to terminals of battery case.

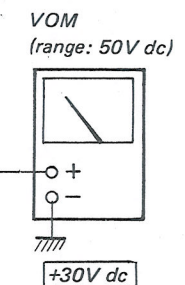


#### TUNING ADJ

- Complete preparations.
- Set TV BAND switch to VHF-H position.
- Set dial film to lowest broadcast channel by turning tuning knob.
- Adjust RV852 so that best picture and best sound are obtained.

#### +30V ADJ

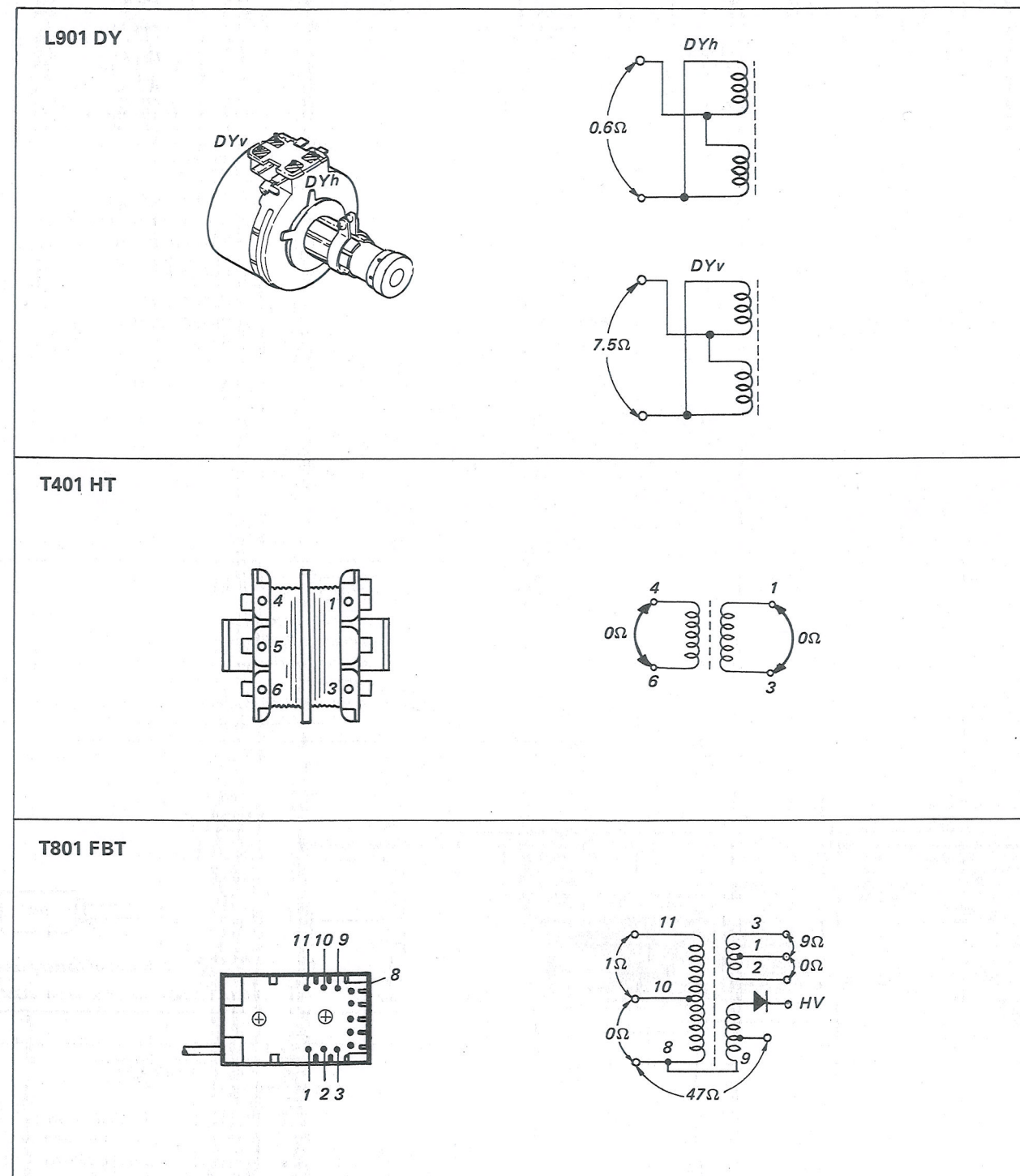
- Set TV BAND switch to VHF-L position.
- Turn the TUNING knob fully counter-clockwise.
- Adjust RV851 for +30V dc on VOM.





## SECTION 4 DIAGRAMS

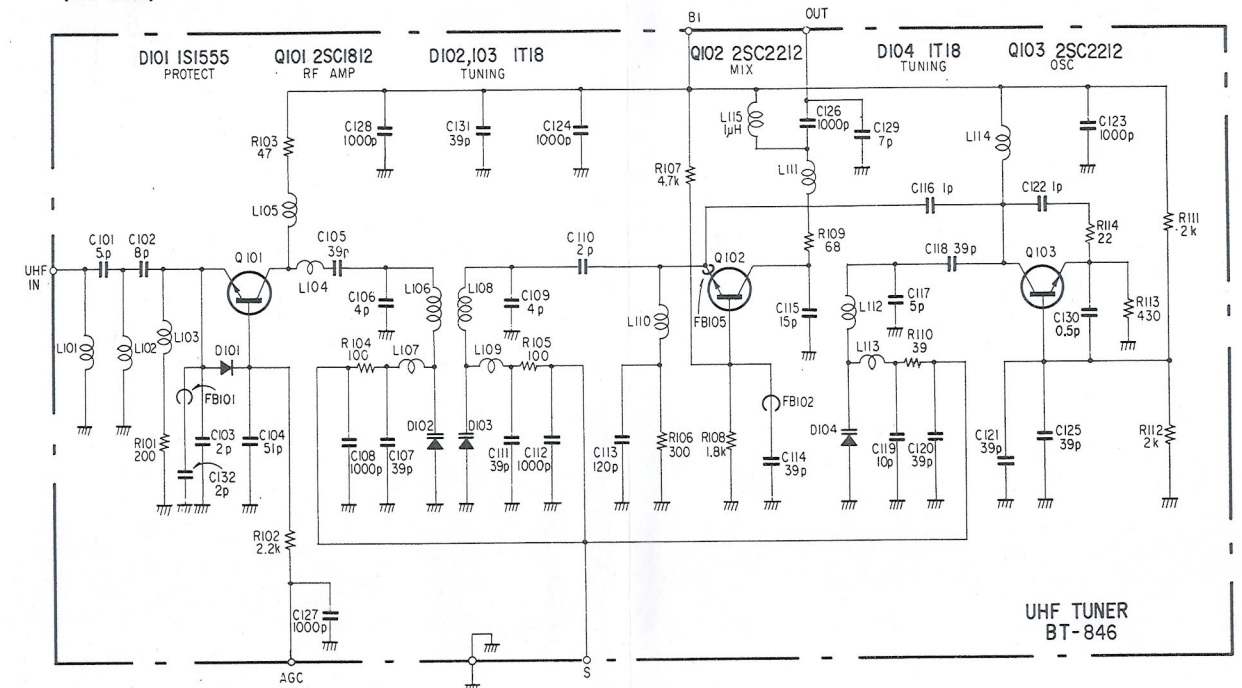
### 4-1. DC RESISTANCE AND WINDING DIAGRAMS OF COILS AND TRANSFORMERS



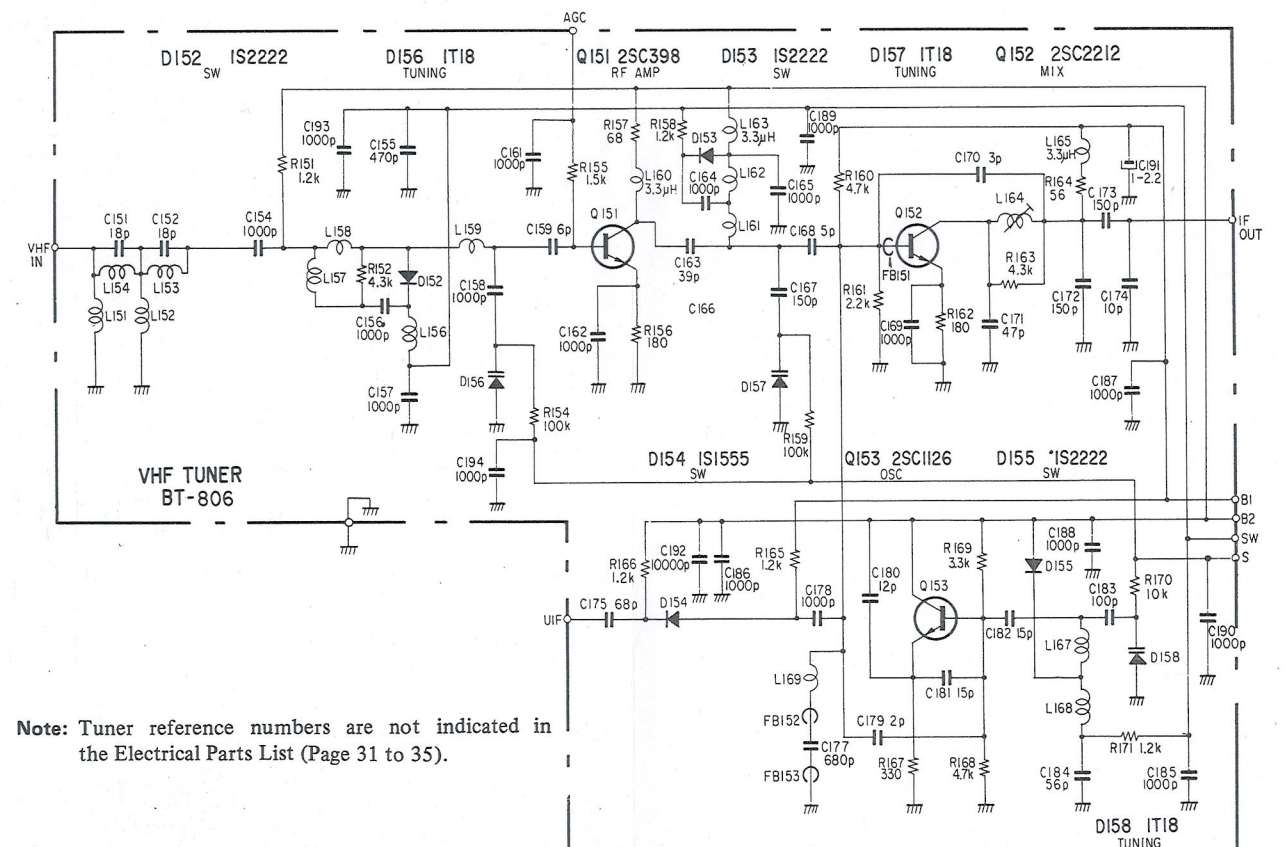
**Note:**  
DC resistance measurements shown with coils and trans-  
formers disconnected from circuit.

### 4-2. TUNER SCHEMATIC DIAGRAM

#### - UHF Tuner - (BT-846)



#### - VHF Tuner - (BT-806)



**Note:** Tuner reference numbers are not indicated in  
the Electrical Parts List (Page 31 to 35).



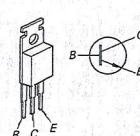
— Conductor Side —

— G and U Boards —

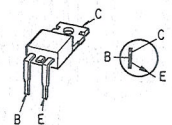


- ○ — : parts extracted from the component side.
- ● — : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.

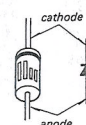
2SC1061



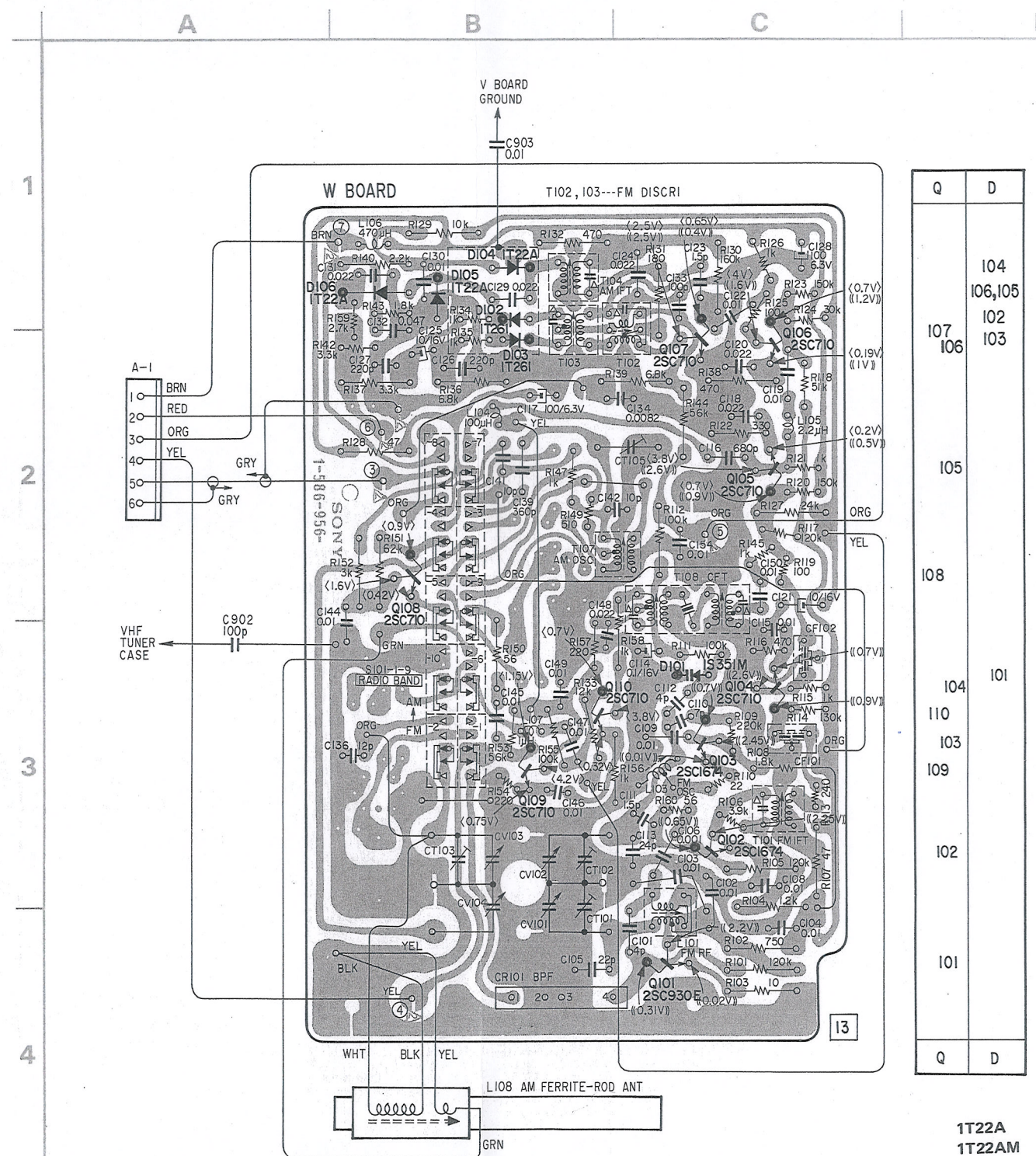
2SC1418



EQA01-10S2



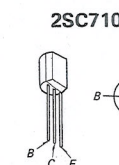
— W Board —



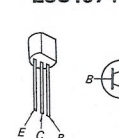
- Note:**

- ○ — : parts extracted from the component side.
- ● — : parts extracted from the conductor side.
- Readings are taken under detuned conditions with a VOM (20k $\Omega$ /V).  
 (( ' )) : FM  
 < > : AM

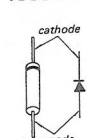
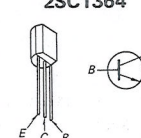
1T22A  
1T22AM  
1T261  
1S2687S-2  
1S351M



2SC930E  
2SC1674

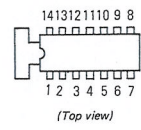


2SC1364

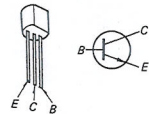




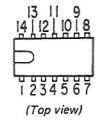
LA4112



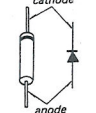
2SC1474  
2SC1475



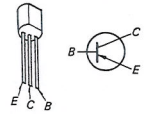
SN76681N



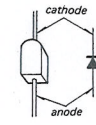
1S1555  
RD4.3E-B



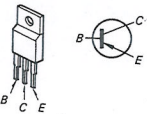
2SA733  
2SA772



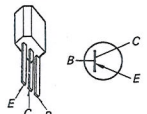
HF1A  
HF1B  
HF1C  
HF1Z



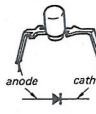
2SA861



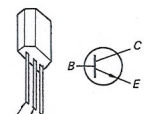
2SA1027R



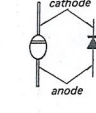
SEL101R



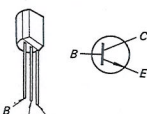
2SC403C



V06C  
V09C



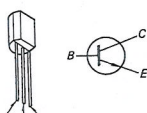
2SC710



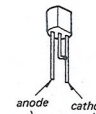
VD1222



2SC1364



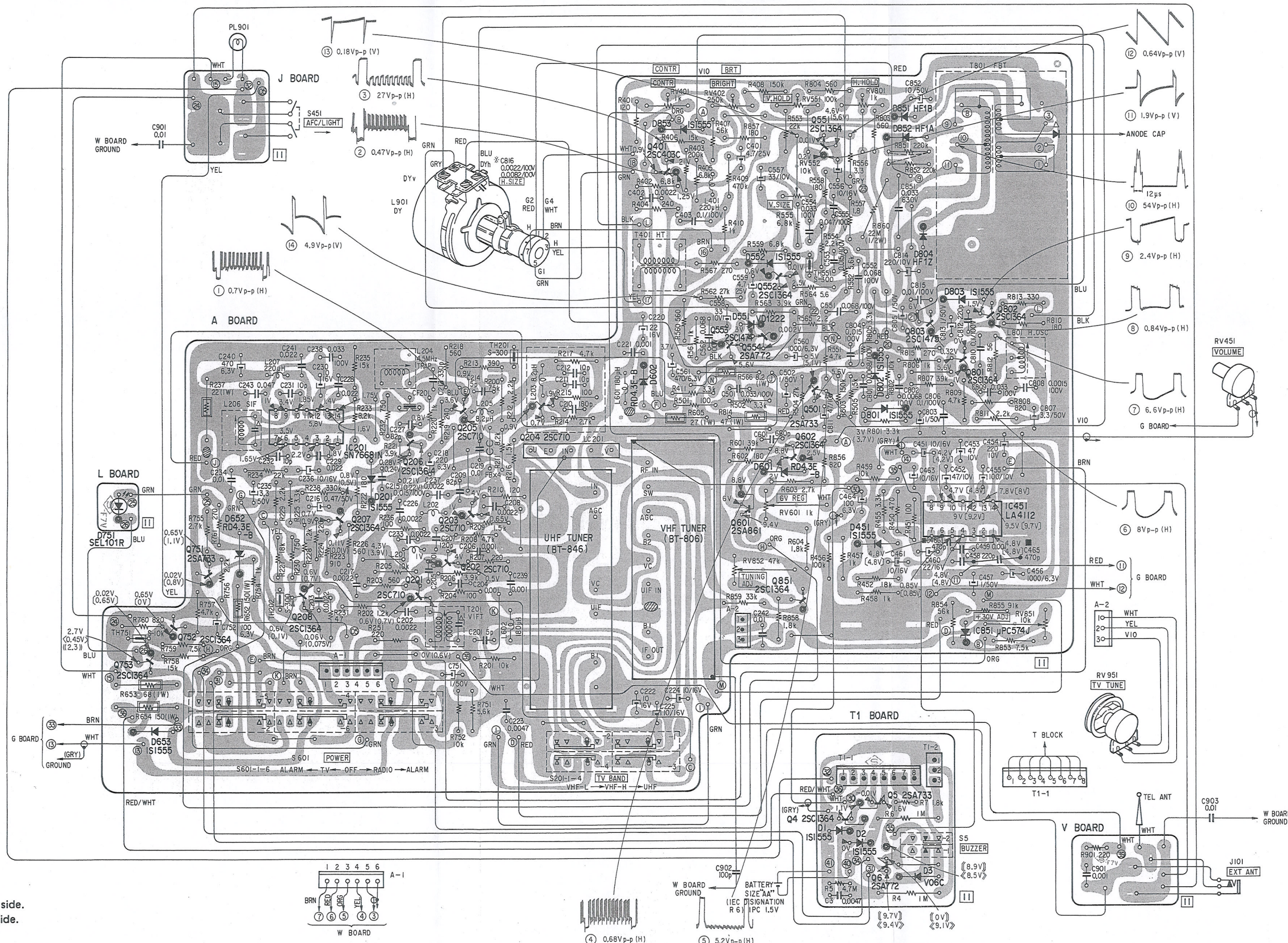
μPD574J



Note:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : part mounted on the conductor side.

Q, IC	753	752	751	IC201 208	207	206 201	205 202	204	401	553	601	554	552 851	602,501	551	4, 5, 6	803	801 IC451	802 IC851	Q, IC
D	751	653	652		201				602	853			552 551,601		1	2	451	852	804 803	D
ADJ						L204		R200				RV852	RV601	RV552					L801 RV851	A D J





#### 4-4. SCHEMATIC DIAGRAM

Note: The components identified by shading and  $\Delta$  mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

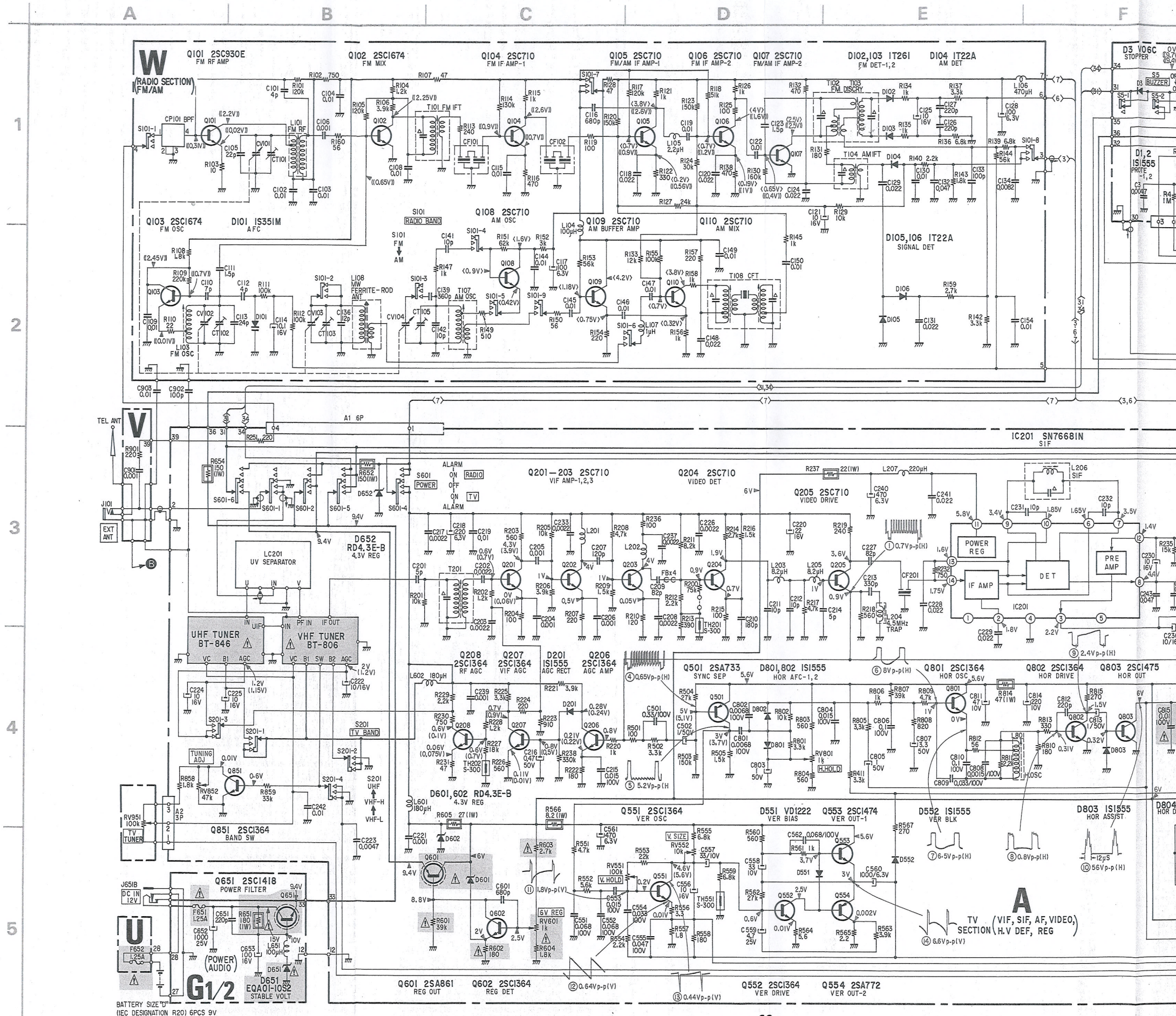
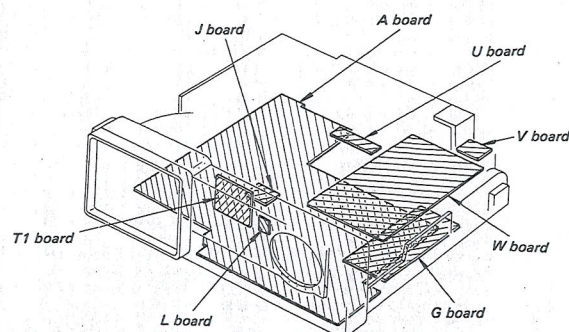
#### Note:

- All capacitors are in  $\mu\text{F}$  and ceramic unless otherwise noted. 50WV or less are not indicated except for electrolytics  $\mu\text{F}$ :  $\mu\text{F}$ , elect: electrolytic
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted. k: 1000 $\Omega$ , M: 1000k $\Omega$
- $\square$ : nonflammable resistor.
- $\Delta$ : internal component.
- $\square$ : panel designation.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Switch

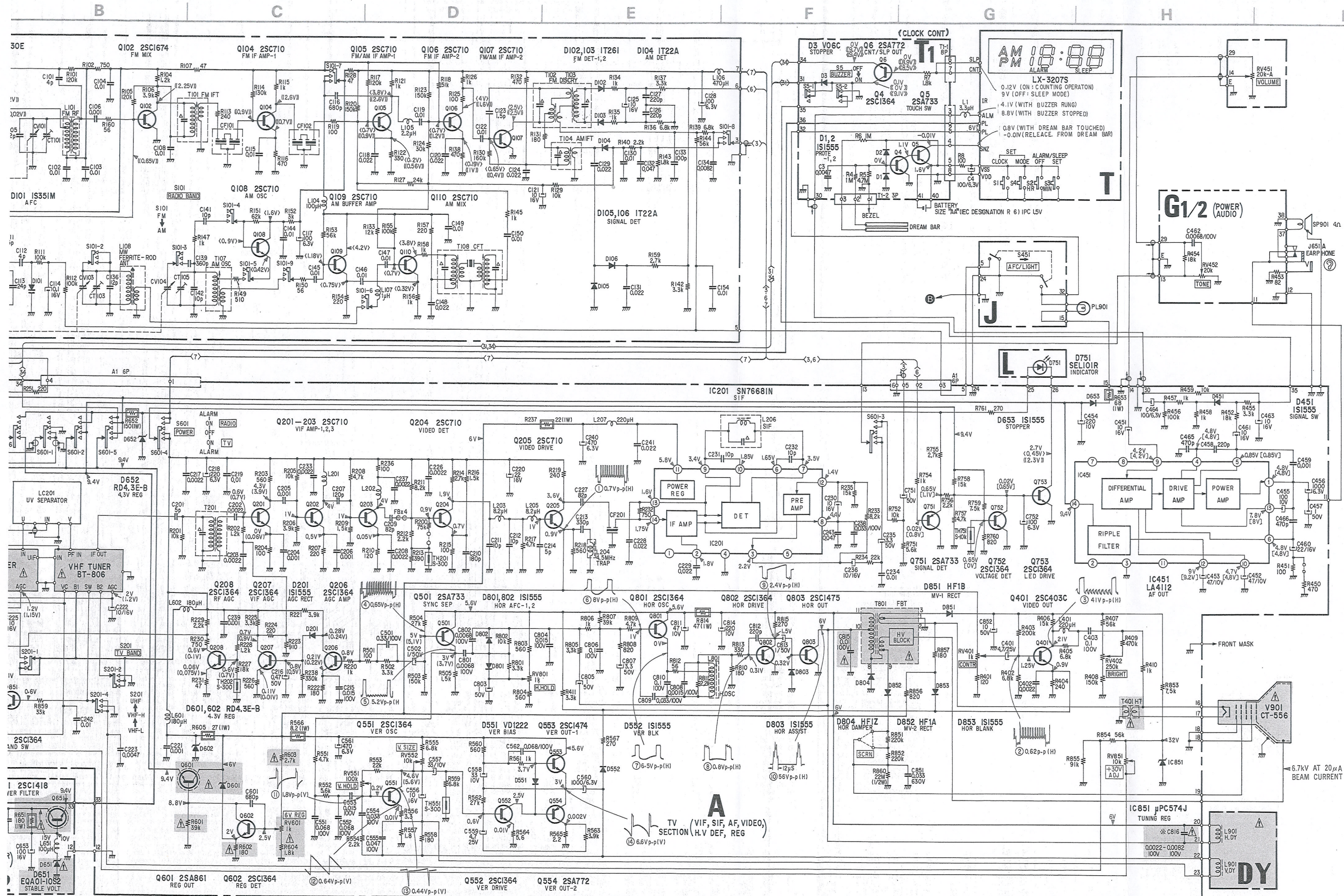
Ref. No.	Switch	Position
S101-1-9	RADIO BAND	FM
S201-1-4	TV BAND	VHF-L
S451	AFC/LIGHT	ON/OFF
S601-1-6	POWER	OFF

- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 20,000-ohm-per-volt VOM.
- Voltage variations may be noted due to normal production tolerances.
- $\ast$ : selected to yield optimum performance.
- $\square$ : adjustment for repair.
- $\text{---}$ : B+ bus.
- All voltages are measured with dc-power operated.
- Voltages in A board are taken under tuned conditions with CONTR and BRIGHT controls set for best picture. ( ): detuned [ ]: FM to AM (( )): FM
- Voltages in W board are taken under detuned conditions. (( )): FM < >: AM
- Voltages in T1 board [ ]: TV BAND RADIO BAND } OFF, with SLEEP MODE << >>: TV BAND RADIO BAND } ON

#### CIRCUIT BOARDS LOCATION





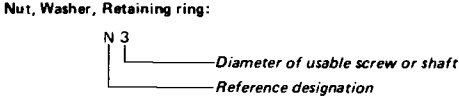
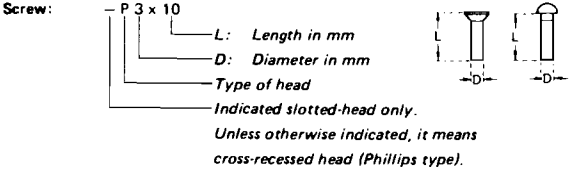




1/4 WATT CARBON RESISTORS

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

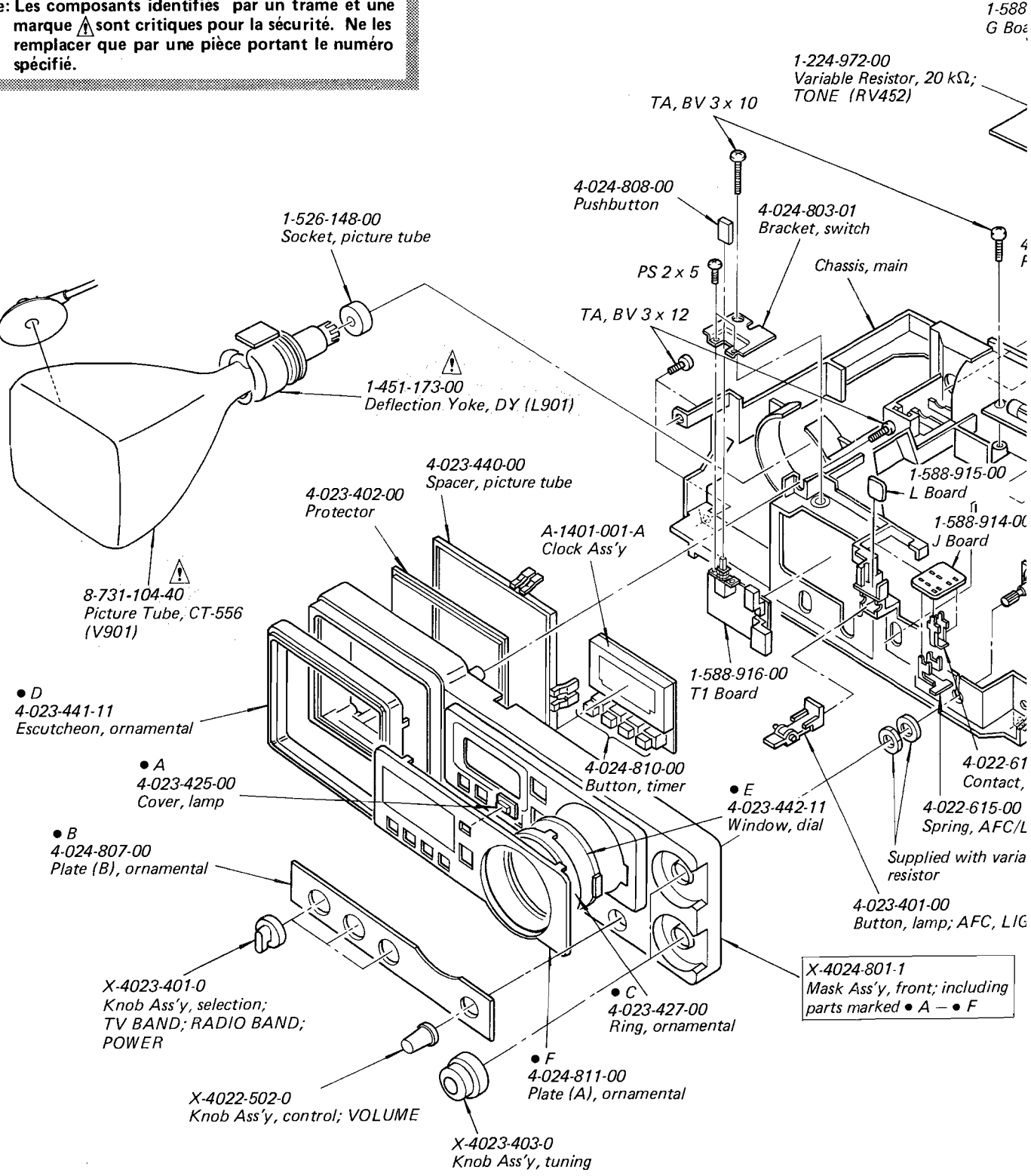
Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

SECTION 5  
EXPLODED VIEWS


A B C D

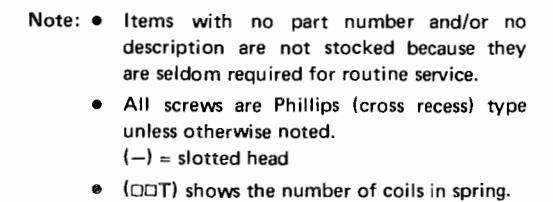
(1) Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



(1)

**Note:** Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



1

2

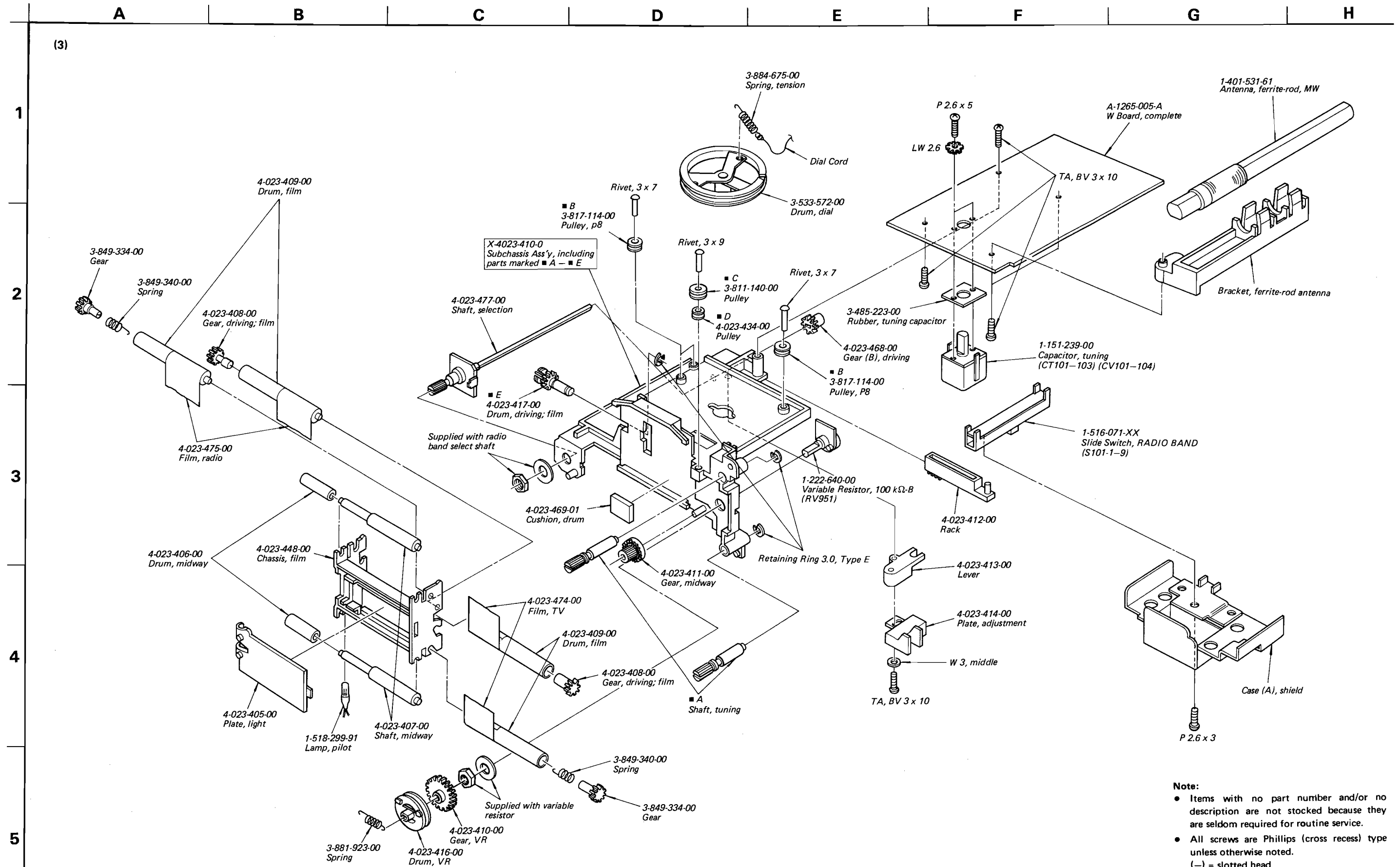
3

4

5



-28-



## SECTION 6 ELECTRICAL PARTS LIST

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>	<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>
<b>TUNERS AND CIRCUIT BOARDS</b>					
	△ 1-463-226-00	UHF Tuner, BT-846	⇒ Q651	8-729-316-12	2SC1061
	△ 1-463-227-00	VHF Tuner, BT-806	⇒ Q751	8-729-612-77	2SA1027R
			Q752, 753	8-729-663-47	2SC1364
	1-588-912-00	G Board	Q801, 802	8-729-663-47	2SC1364
	1-588-913-00	U Board	Q803	8-760-413-10	2SC1475
	1-588-914-00	J Board	Q851	8-729-663-47	2SC1364
	1-588-915-00	L Board	<b>ICs</b>		
	1-588-916-00	T1 Board	IC201	8-759-966-81	SN76681N
	1-588-917-00	V Board	IC451	8-759-841-12	LA4112
	A-1265-005-A	W Board, complete	IC851	8-759-157-40	μPC574J
	A-1295-267-A	A Board, complete	<b>Diodes</b>		
	A-1401-001-A	Clock Ass'y	D1, 2	8-719-815-55	1S1555
<b>SEMICONDUCTORS</b>			D3	8-719-900-93	V09C
<b>Transistors</b>			⇒ D101	8-719-768-72	1S2687S-2
Q4	8-729-663-47	2SC1364	D102, 103	8-719-026-11	1T261
⇒ Q5	8-729-612-77	2SA1027R	⇒ D104-106	8-719-422-21	1T22AM
Q6	8-760-513-10	2SA772	D201	8-719-815-55	1S1555
Q101	8-729-803-04	2SC930	D451	8-719-815-55	1S1555
⇒ Q102, 103	8-729-663-47	2SC1364	D551	8-719-122-20	VD1222
Q104	8-729-671-13	2SC710	D552	8-719-815-55	1S1555
Q105	8-729-671-14	2SC710	D601	△ 8-719-143-07	RD4.3E
Q106	8-729-671-13	2SC710	D602	8-719-143-07	RD4.3E
Q107	8-729-671-15	2SC710	D651	△ 8-719-991-04	EQA01-10S2
Q108, 109	8-729-671-13	2SC710	D652	8-719-143-07	RD4.3E
Q110	8-729-671-14	2SC710	D653	8-719-815-55	1S1555
Q201-205	8-729-671-14	2SC710	D751	8-719-301-11	SEL101R
Q206-208	8-729-663-47	2SC1364	D801-803	8-719-815-55	1S1555
Q401	8-724-375-01	2SC403C	D804	8-719-320-11	HF1A
⇒ Q501	8-729-612-77	2SA1027R	⇒ D851	8-719-320-31	HF1C
Q551, 552	8-729-663-47	2SC1364	D852	8-719-320-11	HF1A
Q553	8-760-335-10	2SC1474	D853	8-719-815-55	1S1555
Q554	8-760-513-10	2SA772			
Q601	8-763-213-00	2SA861			
Q602	8-729-663-47	2SC1364			

- ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

**Note:** The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

**Note:** Les composants identifiés par un tramé et une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Ref. No.   Part No.   Description

## Miscellaneous

⇒ TH201,202 ) 1-800-071-XX Thermistor, TH-350  
 ⇒ TH551  
 TH751 1-800-202-XX Thermistor, S-10K

## COILS

All coils are microinductors unless otherwise noted.

L1	1-407-184-XX	3.3μH
L101	1-425-632-00	FM RF
L103	1-405-595-00	FM OSC
L104	1-407-169-XX	100μH
L105	1-407-182-XX	2.2μH
L106	1-407-177-XX	470μH
L107	1-407-178-XX	1μH
L108	1-401-531-XX	MW Ferrite-rod Antenna
L201	1-420-830-00	CIF
L203	1-407-189-XX	8.2μH
L204	1-409-179-00	4.5MHz TRAP
L205	1-407-189-XX	8.2μH
L206	1-404-103-00	SIF
L207	1-407-173-XX	220μH
L401	1-407-173-XX	220μH
L601, 602	1-407-172-XX	180μH
L651	1-407-169-XX	100μH
L801	1-405-760-00	H. OSC
L901	⚠ 1-451-173-00	Deflection Yoke, DY

## TRANSFORMERS AND FILTERS

CF101, 102	1-527-184-XX	Ceramic Filter 10.7MHz
CF201	1-527-260-00	Ceramic Filter 4.5MHz
CP101	1-231-286-00	Bandpass Filter
T101	1-403-872-00	FM IFT

• ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.   Part No.   Description

T102	1-403-952-00	FM Discriminator
T103	1-403-953-00	FM Discriminator
T104	1-404-041-00	AM IFT
T107	1-405-520-00	AM OSC
T108	1-403-165-00	CFT
T201	1-404-118-00	VIFT
T401	⚠ 1-442-757-00	Heater, HT
T801	⚠ 1-453-077-00	Flyback, FBT

## CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.  
 50WV or less are not indicated except for electrolytics.  
 p : μμF, elect : electrolytic

C3	1-102-116-00	680p		
C101	1-102-937-00	4p		
C102-104	1-101-923-00	0.01		
C105	1-102-959-00	22p		
C106	1-102-074-00	0.001		
C108, 109	1-101-923-00	0.01		
C110	1-102-506-00	7p		
C111	1-101-576-00	1.5p		
C112	1-102-504-00	4p		
C113	1-102-960-00	24p		
C114	1-131-402-00	0.1	16V	tantalum
C115	1-101-923-00	0.01		
C116	1-102-116-00	680p		
C117	1-121-413-00	100	6.3V	elect
C118	1-101-924-00	0.022		
C119	1-101-923-00	0.01		
C120	1-101-924-00	0.022		
C121	1-121-651-00	10	16V	elect
C122	1-101-923-00	0.01		
C123	1-101-576-00	1.5p		
C124	1-101-924-00	0.022		
C125	1-121-651-00	10	16V	elect

Note: Les composants identifiés par un trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>					<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>				
C126, 127	1-102-978-00	220p					C228, 229	1-101-005-00	0.022				
C128	1-121-413-00	100	6.3V	elect			C230	1-123-316-00	10	16V	elect		
C129	1-101-924-00	0.022					C231, 232	1-102-947-00	10p				
C130	1-161-013-00	0.01		(semiconductor)			C233	1-101-002-00	0.0022				
C131	1-101-924-00	0.022					C234	1-101-004-00	0.01				
C132	1-161-021-00	0.047		(semiconductor)			C235	1-123-354-00	3.3	50V	elect		
C133	1-102-973-00	100p					C236	1-123-316-00	10	16V	elect		
C134	1-161-012-00	0.0082		(semiconductor)			C237	1-101-002-00	0.0022				
C135	1-101-923-00	0.01					C238	1-108-383-00	0.033	100V	mylar		
C136	1-102-949-00	12p					C239	1-101-455-00	0.001				
C139	1-107-231-00	360p					C240	1-123-298-00	470	6.3V	elect		
C141	1-102-947-00	10p					C241	1-101-005-00	0.022				
C142	1-102-285-00	10p					C242	1-101-004-00	0.01				
C144-147	1-101-923-00	0.01					C243	1-101-006-00	0.047				
C148	1-101-924-00	0.022					C401	1-123-328-00	4.7	25V	elect		
C149, 150	1-101-923-00	0.01					C402	1-102-121-00	0.002				
C201	1-102-942-00	5p					C403	1-108-389-00	0.1	100V	mylar		
C202, 203	1-101-002-00	0.0022					C451	1-123-316-00	10	16V	elect		
C204-206	1-101-455-00	0.001					C452, 453	1-123-306-00	47	10V	elect		
C207	1-101-361-00	150p					C454	1-123-308-00	220	10V	elect		
C208	1-101-002-00	0.0022					C455	1-123-307-00	100	10V	elect		
C209	1-102-971-00	82p					C456	1-123-299-00	1000	6.3V	elect		
C210	1-102-976-00	180p					C457	1-123-352-00	1	50V	elect		
C211, 212	1-102-947-00	10p					C458	1-102-110-00	220p				
C213	1-102-820-00	330p					C459	1-101-455-00	0.001				
C214	1-102-942-21	5p					C460	1-123-317-00	22	16V	elect		
C215	1-108-379-00	0.015	100V	mylar			C461	1-123-316-00	10	16V	elect		
C216	1-123-351-00	0.47	50V	elect			C462	1-108-624-00	0.0068	100V	mylar		
C217	1-101-002-00	0.0022					C463	1-123-316-00	10	16V	elect		
C218	1-123-296-00	220	6.3V	elect			C464	1-123-295-00	100	6.3V	elect		
C219	1-101-004-00	0.01					C501	1-108-383-00	0.033	100V	mylar		
C220	1-123-317-00	22	16V	elect			C502	1-123-352-00	1	50V	elect		
C221	1-101-455-00	0.001					C551, 552	1-108-387-00	0.068	100V	mylar		
C222	1-123-316-00	10	16V	elect			C553	1-108-379-00	0.015	100V	mylar		
C223	1-101-003-00	0.0047					C554	1-108-383-00	0.033	100V	mylar		
C224, 225	1-123-316-00	10	16V	elect			C555	1-108-385-00	0.047	100V	mylar		
C226	1-101-002-00	0.0022					C556	1-131-199-00	10	16V	tantalum		
C227	1-102-971-00	82p											

Ref. No.	Part No.	Description
C557, 558	1-123-305-00	33 10V elect
C559	1-123-328-00	4.7 25V elect
C560	1-123-299-00	1000 6.3V elect
C561	1-123-298-00	470 6.3V elect
C562	1-108-387-00	0.068 100V mylar
C601	1-102-116-00	680p
C651	1-102-978-00	220p
C652	1-119-165-00	1000 25V elect
C653	1-123-320-00	100 16V elect
C751	1-123-352-00	1 50V elect
C752	1-123-295-00	100 6.3V elect
C801, 802	1-108-624-00	0.0068 100V mylar
C803	1-123-352-00	1 50V elect
C804	1-108-379-00	0.015 100V mylar
C805	1-123-352-00	1 50V elect
C806	1-108-389-00	0.1 100V mylar
C807	1-123-354-00	3.3 50V elect
C808	1-108-367-00	0.0015 100V mylar
C809	1-108-383-00	0.033 100V mylar
C810	1-108-389-00	0.1 100V mylar
C811	1-123-306-00	47 10V elect
C812	1-102-110-00	220p
C813	1-123-352-00	1 50V elect
C814	1-123-308-00	220 10V elect
C815	▲ 1-108-377-00	0.01 100V mylar
* C816	▲ 1-108-369-00	0.0022 100V mylar
	1-108-620-00	0.0033 100V mylar
	▲ 1-108-373-00	0.0047 100V mylar
	1-108-624-00	0.0068 100V mylar
	1-108-625-00	0.0082 100V mylar
C851	1-129-736-00	0.033 630V polyethylene
C852	1-123-356-00	10 50V elect
C901	1-101-455-00	0.001
C902	1-102-973-00	100p
C903	1-102-129-00	0.01
CT101-103	1-151-239-00	Trimmer
CT105	1-141-138-XX	Trimmer

\* Selected to yield optimum performance.

Note: The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description
CV101-104	1-151-239-00	Trimmer

## RESISTORS



All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on page 24 for their part numbers. All variable and adjustable resistors have characteristic curve B, unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ

R4	1-202-719-00	1M	¼W	composition
R6	1-202-719-00	1M	¼W	composition
R237	1-212-376-00	22	1W	metal oxide (nonflammable)
R566	1-212-371-00	8.2	1W	metal oxide (nonflammable)
R601	▲ 1-246-511-00	39k	¼W	Carbon
R602	▲ 1-246-455-00	180	¼W	carbon
R603	▲ 1-246-483-00	2.7k	¼W	carbon
R604	▲ 1-246-481-00	1.8k	¼W	carbon
R605	1-213-124-00	27	1W	metal oxide (nonflammable)
R651	▲ 1-213-134-00	180	1W	metal oxide (nonflammable)
R652	1-213-133-00	150	1W	metal oxide (nonflammable)
R653	1-213-129-00	68	1W	metal oxide (nonflammable)
R654	1-213-133-00	150	1W	metal oxide (nonflammable)
R814	1-213-127-00	47	1W	metal oxide (nonflammable)
R860	1-202-735-00	22M	¼W	composition
RV401	1-224-897-00	1k, variable; CONTR		
RV402	1-224-899-00	250k, variable; BRT		
RV451	1-224-694-XX	20k-A, variable; VOL		
RV452	1-224-972-00	20k, variable; TONE		
RV551	1-224-898-00	100k, variable; V. HOLD		
RV552	1-224-645-XX	10k, adjustable; V. SIZE		
RV601	▲ 1-224-642-XX	1k, adjustable; +6V ADJ		

Note: Les composants identifiés par un trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.


<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RV801	1-224-897-00	1k, adjustable; H. HOLD
RV851	1-224-645-XX	10k, adjustable; +25V ADJ
RV852	1-224-647-XX	47k, adjustable; TUNING ADJ
RV951	1-222-640-00	100k, variable; TV TUNE


**MISCELLANEOUS**

F651,652	 1-532-402-XX	Fuse, 1.25A
J101	1-507-569-00	Jack, EXT ANT
J651	1-507-579-00	Jack, EARPHONE
LC201	1-417-060-00	Separator, UV
PL901	1-518-299-91	Lamp, pilot
S5	1-552-854-00	Switch, push; BUZZER
S101	1-516-071-XX	Switch, slide; RADIO BAND
S201	1-552-252-00	Switch, rotary slide; TV BAND
S451	4-022-614-00	Piece, contact
	4-022-615-00	Spring, contact
		) AFC/LIGHT
S601	1-552-867-00	Switch, rotary; POWER
SP901	1-502-636-00	Speaker, 4Ω
V901	 8-731-104-40	Picture Tube, CT-556
	1-401-531-60	Antenna, ferrite-rod; MW
	1-501-181-00	Antenna, telescopic
	1-526-148-00	Socket, picture tube
	1-543-060-00	Core

**ACCESSORIES AND PACKING MATERIALS**

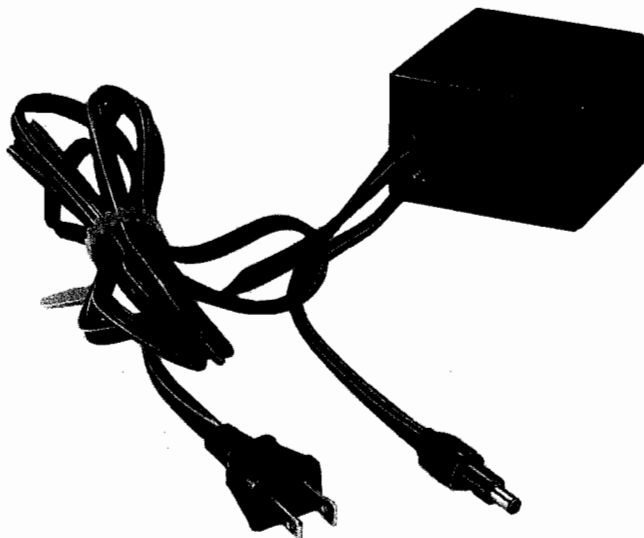
<u>Part No.</u>	<u>Description</u>
1-504-059-11	Magnetic Earphone, ME-20H
1-528-027-11	Battery, size "AA" (IEC Designation R6)
3-701-625-00	Bag, polyethylene
3-701-730-00	Envelope, IBM card
3-794-233-21	Instruction
4-023-444-00	Hood
4-023-459-00	Bag, protection
4-023-462-00	Cushion, right
4-023-463-00	Cushion, left
4-023-483-00	Cushion
4-024-805-00	Contact, battery
4-491-213-21	Instruction
4-495-819-21	Manual, instruction (US model)
4-495-819-31	Manual, instruction (Canadian model)
A-1000-458-A	AC Adaptor, AC-121W (US model)
A-1000-468-A	AC Adaptor, AC-121W (Canadian model)

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



# AC-121W



## AC ADAPTOR

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### SPECIFICATIONS

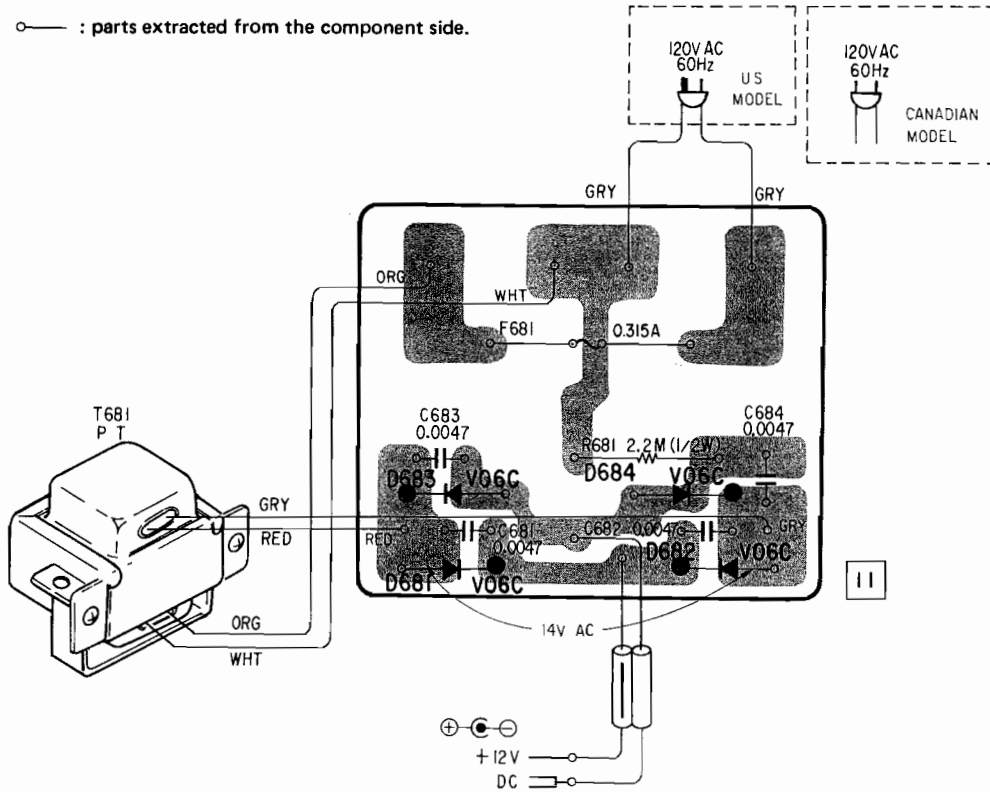
<b>Power Requirements:</b>	120 V, 60 Hz
<b>Power Consumption:</b>	14.5 W ac with FX-412 operated.
<b>Dimensions:</b>	Approx. 78 (w) x 53 (h) x 80 (d) mm 3 1/8 (w) x 2 1/8 (h) x 3 1/8 (d) inches excluding power cord and dc cord.
<b>Net Weight:</b>	Approx. 640 g, 23 oz (US model) 600 g, 21 oz (Canadian model) including power cord and dc cord.

## 1. MOUNTING DIAGRAM

— Conductor Side —

— F Board —

Note: • — : parts extracted from the component side.



## 2. SCHEMATIC DIAGRAM

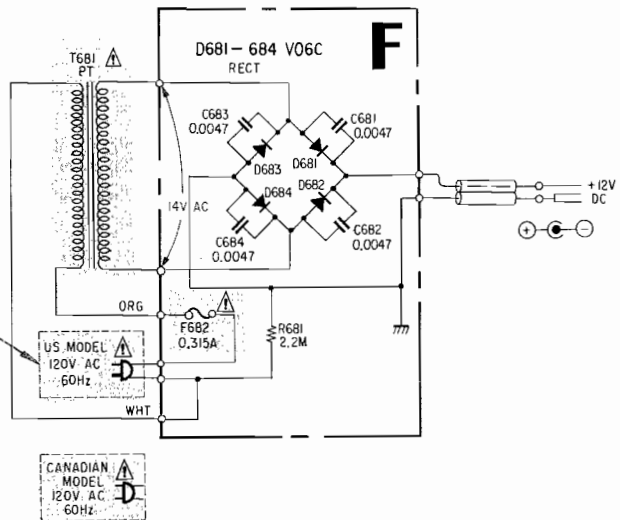
— F Board —


Note:


- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} : \mu\text{F}$  50WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted.  $\text{k}\Omega : 1000\Omega$ ;  $\text{M}\Omega : 1000\text{k}\Omega$

### CAUTION

This set is equipped with a polarized AC power cord plug (one blade of the plug is wider than the other). When replacing the AC power cord, be sure to connect it with specified part number as shown in this diagram.

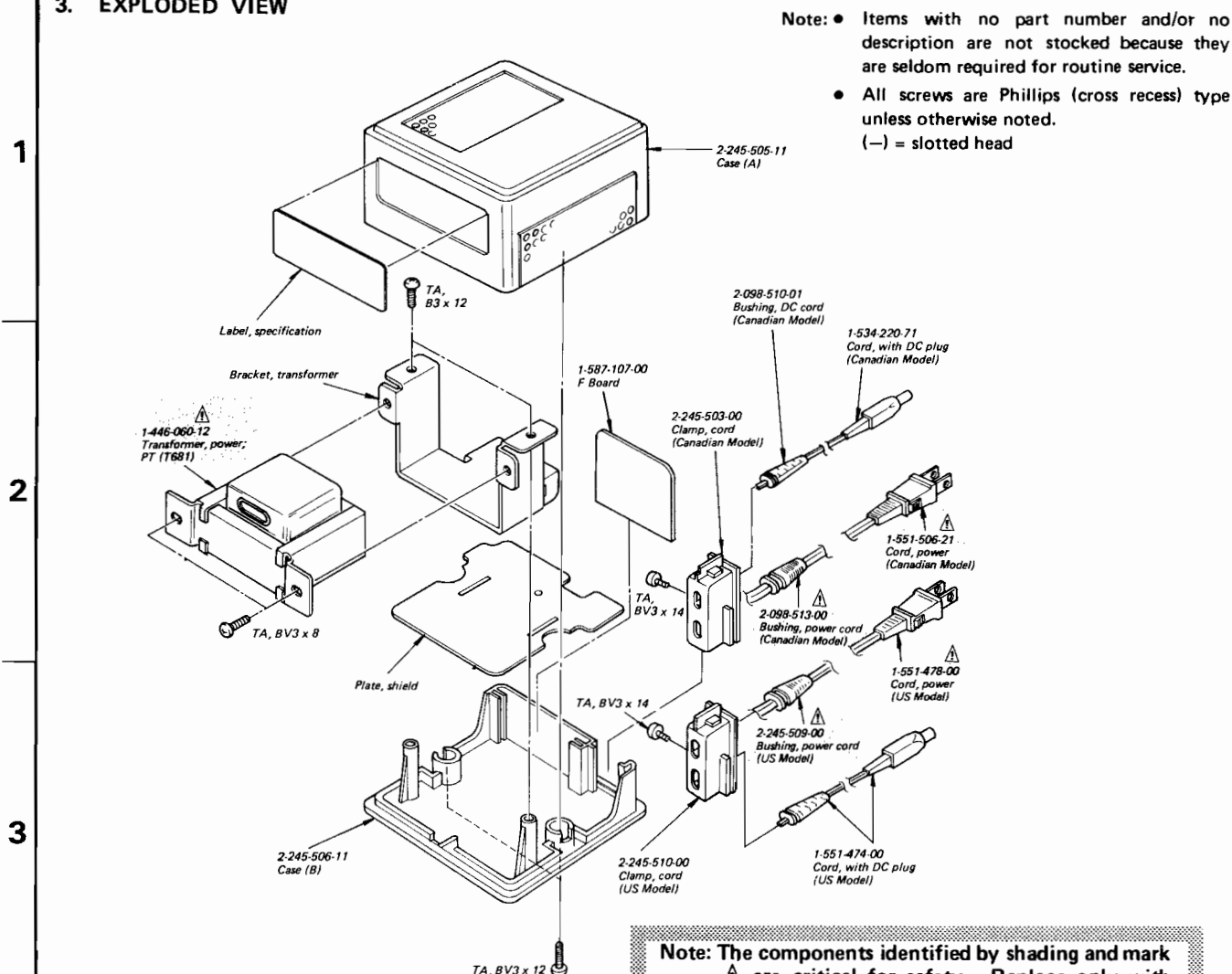



Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.


Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.







### 3. EXPLODED VIEW



**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

**Note:** Les composants identifiés par un tramé et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

### 4. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
C681-684	1-101-003-00	Capacitor, ceramic; 0.0047μF
⇒ D681-684	8-719-900-93	Diode, V09C
F681	 1-532-400-XX	Fuse, 0.315A
R681	1-202-723-00	Resistor, composition; 2.2MΩ ½W
T681	 1-446-060-12	Transformer, power; PT
	1-534-220-71	Cord with DC plug
	 1-551-506-21	Cord, power
	1-551-474-00	Cord with DC plug
	 1-551-478-00	Cord, power
	1-587-107-00	F Board

• ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

**Sony Corporation**

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9-962-502-01

79E0450-1  
Printed in Japan

Date: January 21, 1982 No: 8304

## TV PRODUCTS

**Model:** TV-413

**Subject:** Part Number Correction

Please make the following corrections in your service manual page 26.

